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A publication of the National Museum of Natural Sciences

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National Museum of Natural Sciences
Musée national des sciences naturelles
P.O. Box 3443, Station D

Vol. 8:2 1988 ISSN 0712-9319

Wolves
Myth and Reality

"Who's afraid of the big bad wolf?" A familiar chant to many small children, this nursery rhyme is one of many negative images our society cherishes about the wolf. Children throughout the western world have grown up with stories such as Little Red Riding Hood, The Three Little Pigs, The Boy Who Cried Wolf — stories that portray the wolf as vicious, sly, seductive, gluttonous, foolish and, above all, evil.

While some may argue that our adult view of the wolf is not coloured by such negative childhood images, there is no denying that the wolf has suffered bad press throughout much of history. Even our language reflects it: the wolf at the door; being thrown to the wolves; the wolf whistle.

The Bible warns to "Beware of false prophets who come to you in sheep's clothing, but inwardly are ravenous wolves" (Matthew 7:15). And during the Middle Ages, people believed that werewolves, humans who took on the shape of wolves by magic and attacked and ate people while in their animal form, were actually the Devil incarnate. The werewolf has since become a popular image in modern cinema.

Not all cultures have negative images of the wolf. Hunting and gathering societies tended to respect the wolf for its skill, and sometimes even emulated it. The Plains Indians, for example, disguised themselves with wolf skins to stalk their bison prey. Among the Northwest Coast Indians, the wolf played an important role as a symbol of strength, courage and wisdom. Bella Coola Indian mothers traditionally painted a wolf's gallbladder on their children's backs as a way of ensuring their spiritual and hunting capabilities.

While western culture had a few positive wolf symbols — Romulus and Remus being suckled by a female wolf, and Kipling's hero Mowgli, who was adopted by wolves — by far the most predominant image is negative.

Confronted with such a picture, we begin to ask ourselves an important question — what is a wolf, really? What do we know of this shy, elusive creature, who plays such an important part in our cultural traditions?

Scientifically speaking, wolves are members of the family Canidae, which includes other dog-like wild animals such as foxes, coyotes, and jackals, as well as the domestic dog. Some people speculate that the human bond with "man's best friend" originally developed because of similarities in the social structure and hunting behaviour of wolves and humans. Whatever the reason, the taming of wolves that lurked around campfires some 15,000 years ago began a process of domestication and selective breeding that has resulted in over 400 breeds of dogs today.

Science Museum of Minnesota

Little Red Riding Hood and the big bad wolf, by Paul Gustave Doré (1833-1883).

Contrary to the image many of us have of the lone wolf, wolves are social animals. They live and hunt in groups called packs, which usually consist of six or seven members that are related to each other, much like an extended family. Studies of wolf packs in captivity have shown that they have a highly organized social structure, which centres around a dominant or alpha male and a dominant female, the only pair that actually breeds.

Wolves are intelligent. They have developed complex ways of interacting and communicating with their pack-mates and with other wolf packs, including scent marking, howling, visual displays and facial and body postures. Scent marking and howling are also used to define the pack's territory and keep other wolves out. Members of the pack cooperate in a number of activities, including looking after or babysitting the pups while the rest of the pack is hunting.

Hunting is also a cooperative activity, particularly in winter, when the whole pack combines its strength and skill to catch and kill large prey animals, such as deer, moose, elk or caribou. Wolves work hard for their food. Their major prey, such as the larged hooved animals mentioned above, are equipped with formidable defences. Studies have shown that wolves capture only about one animal out of every ten they chase, and that they are more likely to kill animals that are at some disadvantage, such as the old, the young and the sick.

Historically, wolves were widely distributed throughout the Northern Hemisphere from Great Britain through Europe, central and northern Asia, and Japan. They occurred in North America from the Mexican plateau north to Greenland, and could be found in every part of Canada except the Queen Charlotte Islands.

Through the centuries, however, the distribution and very existence of the wolf has been greatly affected by its primary enemy, man. And a look at the wolf would not be complete without also considering the conflict between wolves and humans.

We have no way of knowing what prehistoric people thought of the wolf, but it is probable that they, like more recent nomadic peoples, coexisted with these wild hunters and viewed them as respected and skilled equals. When hunting and gathering societies turned to a way of life based on farming and herding, the wolf became feared and hated as a threat to humans and their livelihood.

As civilization spread, the wolf suffered in a variety of ways. The clearing of land destroyed its habitat as well as that of its prey. And, fueled by superstition and legend in addition to a legitimate desire to protect their livestock from predation, Europeans waged a war on wolves that was almost successful in wiping them out.

When settlers came from Europe to North America, they found wolves everywhere, from the beaches of the East Coast throughout the forested regions, across the vast plains and in the mountains of the West. Inspired by their traditions, they set out to exterminate the beast, using traps, poisons, bounties and any other means at their disposal.

Today the wolf is an endangered species in almost all parts of the United States except Minnesota and Alaska. In Canada, the wolf is not endangered, but it has been exterminated in large parts of southern British Columbia, the Prairie Provinces, Ontario, Quebec, the Maritime Provinces and Newfoundland.

The history of conflict between wolves and humans is still being written in this country. By the 1960s, provincial and territorial governments had put a stop to large-scale wolf-control programmes. But a controversy continues to rage in parts of western and northern Canada over whether wolves should be killed in order to increase numbers of large prey animals, such as deer and moose, that are favoured by human hunters.

Fear and hatred based on centuries of culture, and the very real competition between wolves and humans for livestock and wild prey, mean that the wolf's place is still not secure. But after years of persecution, the wolf has made a comeback. To many people, the chorus of a wolf pack howling in the night has become the ultimate wilderness experience — and a symbol of our Canadian heritage.

For people who would like to find out more about the wolf in myth and reality, a special exhibit, *Wolves and Humans: Coexistence, Competition and Conflict*, is on display at the National Museum of Natural Sciences until October 9. Produced by the Science Museum of Minnesota, the exhibit is currently travelling in North America. Ottawa is the only Canadian stop on its tour. Highlights of programmes related to the exhibit include a weekend on wolves, a national howling contest, workshops, demonstrations, films, storytelling, mask-making and theatre. For more information, call 996-3102.

Carol Thiessen
Public Services Division

The Second International Conference of Leech Scientists

Leeches are in the news. "Boy's severed ear saved." (*The Ottawa Citizen*, September 25, 1985). "Slimy leeches making medical comeback." (*The Toronto Star*, January 23, 1988). After plastic surgeons have reattached fingers, ears or hands, and while the veins are regenerating, medicinal leeches may be used to pump blood out of the congested tissues. These segmented worms, closely related to earthworms, are renowned for their ability to suck blood. The leech also injects an anesthetic and anticoagulants, which prevent the clotting of blood. Scientists have isolated leech anticoagulants and other biochemicals with potential applications in cardiology and cancer treatment. Some researchers believe the leech is "a living pharmacopoeia," which may yield more drugs in the future. After a half-century of disrepute resulting from indiscriminate leech applications for every ailment known to man, modern medicine has developed a renewed respect for leeches.

There are over 500 leech species in the world. Many specialize in attacking certain types of snails, birds, fish, turtles, and frogs. To extract their meal, they insert a tiny proboscis into soft tissues of their host. Some are carnivores that can swallow prey — such as insect larvae — whole.

The first International Conference was held by the British Association of Leech Scientists in 1986 in Wales. We are excited about holding the second Conference under the auspices of the National Museum of Natural Sciences at the Victoria Memorial Museum Building, in Ottawa, from June 23 to 25, 1988.

The NMNS curates a collection of 1150 samples of leeches belonging to 70 species from 15 countries and four continents. This fine collection, dating back to 1894, is the basis for a taxonomic workshop that will be held as part of the Conference. All the information pertaining to the specimens has been archived with the assistance of the computers of the Canadian Heritage Information Network.

Jacqueline Madill, Zoology Division

*The American medicinal leech, **Macrobdella decora**, in relaxed and curled positions.*

The general theme of the Conference is "Leeches: Pest or Cure." The taxonomic workshop, oral and poster presentations, a tour of the National Annelida Collection, a reception and banquet are all part of the meeting. Participation is open to anyone interested in leeches. This is a multidisciplinary conference, the type of meeting from which everyone can learn and benefit. Experts will present their research and discuss some hot topics. In Canada, an active group at the University of Calgary is studying the freshwater ecology of leeches. Leeches are used as bioindicators of pesticides in the environment. On both coasts, parasitologists are aware of the threat of leeches transferring protozoan fish diseases. As experimental laboratory animals, leeches are reaching their potential; physiologists can record the reactions of particular neurons, reflexes and resulting behaviour.

The official sponsors of the Conference are the NMNS, the University of Calgary, the Canadian Society of Zoologists, and Air Canada. The President is Jacqueline Madill, a "leech lady" for the past ten years. The Vice-President is Dr. Ronald W. Davies, head of the Biology Department, University of Calgary. For further information, please contact Jacqueline Madill, Zoology Division, NMNS, (613) 954-2582.

Peter G. Frank, Zoology Division

Jacqueline Madill, President of the Second International Conference of Leech Scientists.

EDITORIAL

The time has come. It is now certain that the Canadian Museum of Civilization (CMC), with whom we now share the Victoria Memorial Museum Building, is moving to Hull into new and magnificent quarters. The exodus will be completed in the spring of 1989. Despite rumors to the contrary, we are not going with them. We will be staying in this wonderful building which last year celebrated its 75th anniversary. We will also be expanding our exhibit space to include all of the space vacated by the CMC. Thus, we will nearly double the amount of space available to tell the story of nature and exhibit the wonders of the universe.

I am determined that we will create ideas for the use of the space that are at least one step beyond the state-of-the-art; we will be leading the way into the future. Innovation and creativity will be hallmarks of the new exhibitions in the National Museum of Natural Sciences. Last year we created an ancient environment on the front lawn for our three mammoths. Soon we will be making final decisions on what we should be displaying in the building, and transporting around the country in travelling exhibits. We are establishing a new emphasis in our programming called "Outreach" (reaching out with our activities to people who for some reason or other cannot come to the Museum itself).

We need to know what subjects you, our audience, would like us to exhibit, publish books about, or to highlight in TV programmes or videos. We know what interests us, and often you and I share the same interests, but not always. Would you like us to exhibit more about unusual or little-known creatures or minerals? Do you like to see lots of different kinds of animals, plants and rocks, or would you like to have more information about a few of them? Would you like to hear and see more about controversial or current subjects? Do you come to the Museum mainly to see things from Canada, or do you like to see exotic things from tropical countries or deep under the seas?

We also need to know how you would like to see it. Do you like to see the real thing, or do models and pictures have the same impact? What about the information you want — how would you like us to present it to you? We can put it in words on the wall, in handouts, on an audio cassette so you can walk around with a walkman while viewing the displays. We have found that you will spend an average of about 45 seconds standing watching a TV screen, but only about 12 seconds reading text. Does this mean you are four times more interested in TV screens than words on a wall? What about having people who stand near the exhibits with auxiliary display material explaining what is on display; do you like this approach?

If you have a moment, write to me and tell me what you would like to see and how we should show it to you in the future galleries, whether here in Ottawa, or on TV, or in travelling exhibits in community centres across the country. Do you listen to the radio — would you like to hear about the natural world on radio? Please write.

Alan R. Emery
Director

BIOME

Editor-in-Chief:
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Acknowledgements:
Bonnie Livingstone
Annie J. Ollivier

Art Direction:
Design and Technical Operations Division, NMNS

Graphic Design:
Acart Graphic Services, Inc.

Illustrations:
Charles Douglas
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Cette publication est également offerte en français

Comments and questions should be directed to:

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Station D
Ottawa, Ontario
K1P 6P4

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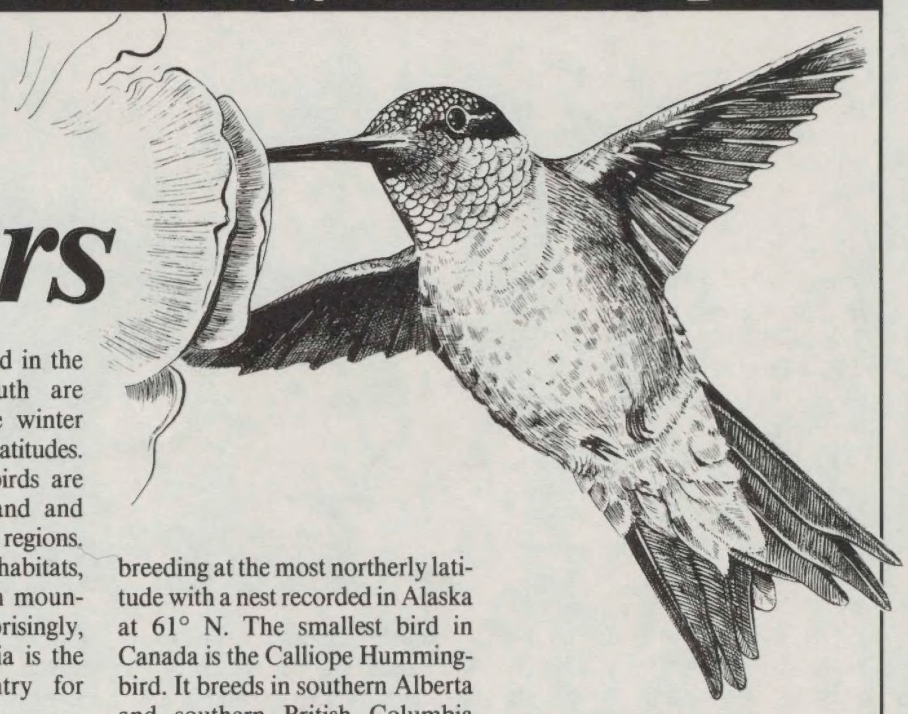
Hummingbirds and their Flowers



Ruby-throated Hummingbird

Birds of a beautiful feather have always been in demand. Hummingbirds are no exception. In the days of the Aztecs, the nobles of Montezuma's court cloaked themselves in garments made entirely of hummingbird skins. The Victorian era also took its toll on hummingbird populations. Auction records indicate that hundreds of thousands of hummingbird skins were bought and sold and the feathers used to make artificial flowers.

Fortunately, hummingbirds are currently in demand by backyard birdwatchers. Hummingbirds adapt themselves readily to rural and uban areas and are frequent visitors to gardens and parks. Attracting them into your backyard can be relatively easy.

Flowers are preferable to the popular sugar and water feeders and have the added advantage of bringing colour to your garden. In a mutually beneficial relationship, hummingbirds cross-pollinate flowers, and flowers provide hummingbirds with nourishment.

Certain types of flowers are particularly attractive to hummingbirds. The ideal flower produces lots of nectar and is easy to feed from while hovering. Plants that are popular with both hummingbirds and gardeners include canna lilies, morning glories, nasturtium, nicotiana, petunia, salvia and scarlet runners, among many others. Beware of enticing hummingbirds into a chemical jungle, however. If you choose to use chemical sprays on your garden, follow the instructions and use them wisely and sparingly.

Planting a variety of species with overlapping flowering periods will ensure a good nectar supply throughout the season. Safe resting areas and perching sites are also attractive. In addition, hummingbirds are very fond of water. A shallow water dish or a gentle mist from the garden hose can be most inviting.

As hummingbirds move from flower to flower in search of food, they demonstrate their unique and admirable flying skills. Their ability to hover and fly backwards enables them to gather nectar and small insects from inside the flowers that they visit. The nectar provides the birds with carbohydrates. The insects are a good source of protein.

In addition to planting flowers that provide a continuous supply of natural nectar, many hummingbird watchers put out a sugar and water feeder. A properly maintained feeder is always clean and filled with a fresh solution of one part white sugar to four parts water. Artificial colouring is not necessary. Although hummingbirds appear to favour red, they are indifferent to colour once they have found a good source of food.

Hummingbirds are often aggressive towards one another. A limited supply of nectar and the patchy distribution of their food resources forces them into keen competition. Adult males are territorial, monopolizing and defending the best flower patches against other birds, as well as bees and butterflies. Females and immature males are often without territories. They survive on widely dispersed, undefended resources, and rely on opportunistic feeding from established territories.

There are about 320 species of hummingbirds worldwide. The family is strictly confined to the New World. The greatest diversity is found within a few degrees of the equator with the population centre being in the subtropical and temperate zones of the Andes in Ecuador, Colombia and Peru. (Colombia has recorded 143 species.) Hummingbirds range from Alaska and Labrador in the north to Tierra del Fuego in the south. Birds that breed in the extreme north and south are migratory and spend the winter months in more temperate latitudes.

In Canada, hummingbirds are absent from Newfoundland and from much of our northern regions. They live in a variety of habitats, but are most abundant in mountainous areas. Not surprisingly, southern British Columbia is the best part of the country for watching hummingbirds.

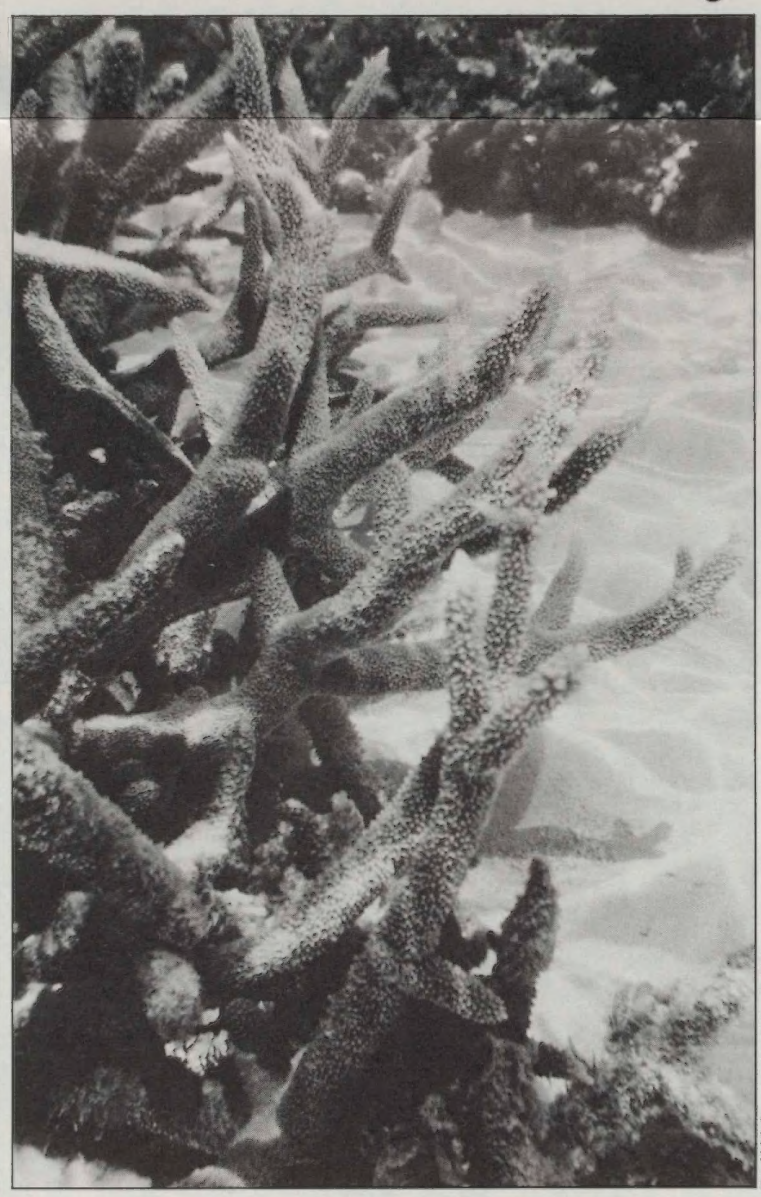
There are five species of hummingbirds known to breed in Canada: the Ruby-throated, Black-chinned, Anna's, Calliope and Rufous Hummingbird. The Ruby-throated is the most widely distributed and is the only species found in the east. The Rufous Hummingbird has been sighted in the Yukon and holds the record for breeding at the most northerly latitude with a nest recorded in Alaska at 61° N. The smallest bird in Canada is the Calliope Hummingbird. It breeds in southern Alberta and southern British Columbia and its average weight is 2.5 g.

Hummingbirds have metallic, iridescent plumage with colours that change with the angle of the light. A well landscaped backyard that is a haven for hummingbirds will brighten up your life!

Carol Campbell
Public Services Division

A View from Down Under:

First Impressions of the Great Barrier Reef



David M. Jarzen, Paleobiology Division

*Portion of the staghorn coral (**Acropora** sp.), one of the important reef-building corals.*

Australia's Great Barrier Reef is situated off the eastern coast of Queensland, in relatively shallow waters, usually not more than 60 m deep.

Like other reefs, the Great Barrier Reef is composed of corals, tiny animals whose limestone skeletons accumulate by the countless millions to form the base structure upon which many other forms of life may live and share a home. The reef is thus a biome — an ecosystem with a distinctive natural combination of plants and animals.

It is the largest living biome in the world. In fact, the white line of reefs, which stretches from the Torres Strait south of New Guinea for over 2300 km to the Tropic of Capricorn, is the only sign of life on earth visible from the Moon.

The reef is not a continuous wall of coral but rather a complex of 2500 individual reefs of varying size and varying distance from the mainland, together enclosing 350,000 km^2 of sea.

The diversity of life associated with the Great Barrier Reef is truly awe-inspiring and, admittedly, quite difficult to comprehend. In and among the corals, the most obvious lifeforms include algae, molluscs (snails and clams), echinoderms (star fishes and sea cucumbers), worms, crabs, fish, reptiles, marine mammals and aquatic birds. The diversity of fish alone is worthy of mention. About 1500 species of fish, often up to 150 species in only a 100 m^2 area, share the reef habitat. There are more species of fish in the reef waters than in the entire Atlantic Ocean!

No one person could ever hope to explore in detail the entire Great Barrier Reef system. Rather we must content ourselves (and humble ourselves) by studying only a small fraction of the reef or, at best, a specific group of lifeforms associated with the reef.

In December of last year, I was provided with the opportunity to visit one of the 71 reefs on which an island (coral cay) has formed, thus providing a land surface surrounded by the reef itself, a place from which to study and enjoy nature underwater.

Heron Island is located on the Tropic of Capricorn about 42 km off the Australian mainland. It is a small (17 ha.) tropical paradise covered with dense vegetation. The University of Queensland has established the Heron Island Research Station on this coral cay, a comfortable and well-equipped facility visited by researchers from around the world, including Jacques Cousteau and his staff. For ten days I swam, snorkeled and, at low tide, walked the reef top (reef rim) to see first hand the marvels of this aquatic "menagerie."

In preparation for my visit to Heron Island, a mere "drop in the ocean," I was directed to several reading sources, including perhaps the best overall account of the Great Barrier Reef, recently published by Reader's Digest Books. The following quote from that book clearly captures my first impressions...

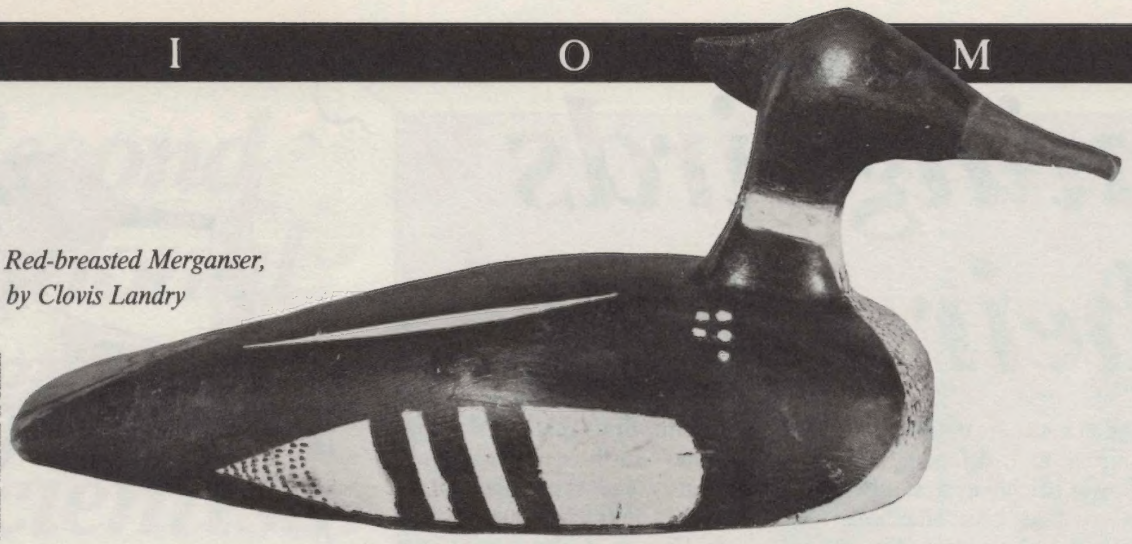
"There are a few places in the world which fulfill the meaning of the word 'enchantment.' They not only delight the senses, but they cast a spell which can affect the behaviour of human beings."

The reef can be likened to a boarding house where several unrelated individuals live together. Normally the communal living is harmonic, but on occasion discord affects the whole of the boarding house. So, too, the reef exists in general harmony, but natural and/or man induced discord may cause temporary or permanent disaster.

The current threat of the Crown of Thorns starfish, which through its uncontrolled feeding has destroyed many parts of the Great Barrier Reef, is a natural disaster that may in time be ameliorated through other natural events. But the effects caused by humans through overcollecting, uncontrolled recreational use and increased pollution may destroy the reef beyond reclamation. I hope not.

The Great Barrier Reef is a magnificent ecosystem that we may someday more fully understand. My impressions are recorded not only by photographs, but also by the permanent, personal memories of a partner with the other creatures of our Earth.

David M. Jarzen
Paleobiology Division
Visiting Scholar
University of Queensland



Red-breasted Merganser, by Clovis Landry

National Museums of Canada

The Real Decoy

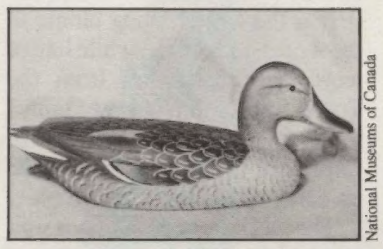
A thousand years ago, waterfowl were so plentiful that migrating flocks darkened the skies. Weary ducks, geese and shorebirds were easily lured into range by North American Indian hunters using simple bird forms made of reeds. Europeans had traditionally used tame, live birds to attract game, but in the New World settlers adopted the Indian decoy. Instead of reeds and twigs, they used wood and produced basic decoys.

By the late 1800s, the basic carving technique had been perfected. The body and head were each sawn in silhouette from a block of soft wood, then shaped with a drawknife. More detail was carved with a small knife, and the head was attached to the body. Painting was rudimentary, with simple but effective patterns that resembled the look of a particular species when seen from a distance.

Fine detail was not needed. It would only be smashed when the decoys, called "blocks," were thrown into carrying bags. It was more important that the arrangement of a set of decoys in the water mimic a flock at rest. Depending on the species, a hunter might set them in a V-shape, with all the decoys facing the wind, or in a circle, with some decoys "feeding" in the centre. It was also important that decoys not bob like corks, or flip upside-down, but that they move in the waves like live birds. Broad bases, keels and weights helped to achieve this effect by transforming wave actions into realistic movements.

Some of the early carvers made thousands of decoys in their lifetimes. Ordinary working men, without formal training in European artistic tastes and techniques, they produced carvings that looked good to them. Most carvers developed their own style, and the best instilled the essence of the bird into the wood with an instinctive use of rhythm, design, balance and proportion.

Decoys that are rooted in craft traditions but expressed with an artist's hand and eye are legitimate folk art. Folk art was "discovered" in the 1930s by collectors who admired the vigour and abstract qualities of such carvings. With this change in the decoy market, carvers were able to spend more time on each piece. In their later years, some carvers produced only decorative decoys, especially when the demand and price for their work rose enough to support carving full-time.



National Museums of Canada

Female Mallard, by D.W. Nichol

Greater detail also had a practical aspect. As decreasing populations of wild ducks became more wary, fine grooves were gouged into the backs of decoys to reduce the unnatural glare of the sun when they were wet. It was only logical to make the grooves resemble real feather patterns. By the 1950s, even working decoys had carved wing tips, surface texture, and more realistic painting.

Carvings of the 1960s and 1970s became even more lifelike. As the environmental movement grew, wildlife carvers sought to express a wider view of nature in their work, and began to depict birds other than waterfowl. With the new inspiration came new techniques. Power grinders, woodburning tools and acrylic paints, used with sophisticated artistry, vastly improved the realism of the carvings. Bird sculptures began to sport detailed bases that helped in depicting how a species behaved in its habitat. Today's most advanced carvings have an incredible amount of detail, with individually carved feathers and startlingly lifelike painting. Hundreds of hours of work can go into each piece, not to mention the time spent in researching a species' biology.

National Museums of Canada

Mother grouse and brood, by Robert Kerr

Many people still love the old decoys carved by craftsmen unaware of the decorative decoy market, and will pay thousands of dollars for a particular carver's work. But neither an antique appearance nor minute detail are necessary for a bird carving to be good art. If a piece expresses the feelings or vision of the carver, and if that expression appeals to you, then feel free to enjoy it. As a bird carver once said, "Anything's art that's done well enough."

The National Museum of Natural Sciences has a small but good collection of decoys. Decoys document the relationship between humans and birds, from the era of market hunting, which nearly wiped out the eastern North American waterfowl populations, to the modern era of bird sanctuaries and bird-watchers. They are a kind of touchable history. In a museum exhibit, a masterful carving can educate people about bird biology, as well as show them an artist's appreciation for nature's design. The decoy is now a symbol of how precious our dwindling natural heritage has become.

Douglas Hoy
Public Services Division

The Activity Corner:

Growing Crystals

Getting Started

Grow your own crystals? Sure, you can easily grow sugar crystals. Here's what you'll need: a small saucepan, one cup of water, two cups of sugar, a stir spoon, a coffee filter, a glass jar, a paper clip, thread and pencil. Make sure your saucepan, stir spoon and jar are clean.

Bring the cup of water to a boil in the saucepan, and gradually add sugar (up to two cups), stirring constantly until no more sugar dissolves. By dissolving so much sugar (the solute) into the boiling water (the solvent), you end up with a saturated solution. Remove the saucepan from the stove and allow it to cool a little before pouring this mixture through a coffee filter into a tall glass jar. Tie a paper clip to one end of a thread and a pencil to the other end, making sure that the paper clip does not touch the bottom of the glass jar when the pencil is placed over the mouth of the jar (just roll up any extra thread onto the pencil — see Figure 1).

Cover the jar with a piece of paper towel to allow for even evaporation and to keep out dust. Put the jar away in a place where it won't be disturbed or subjected to changes in temperature. Temperature changes affect crystal growth by changing the saturation level of the solution; a cool solution usually can't hold as much solute as a hot solution (salt is a notable exception). If you place the jar by a cold window, you will quickly end up with many small crystals, but placing it in a warm closet for a long time (up to two weeks) will give you bigger crystals.

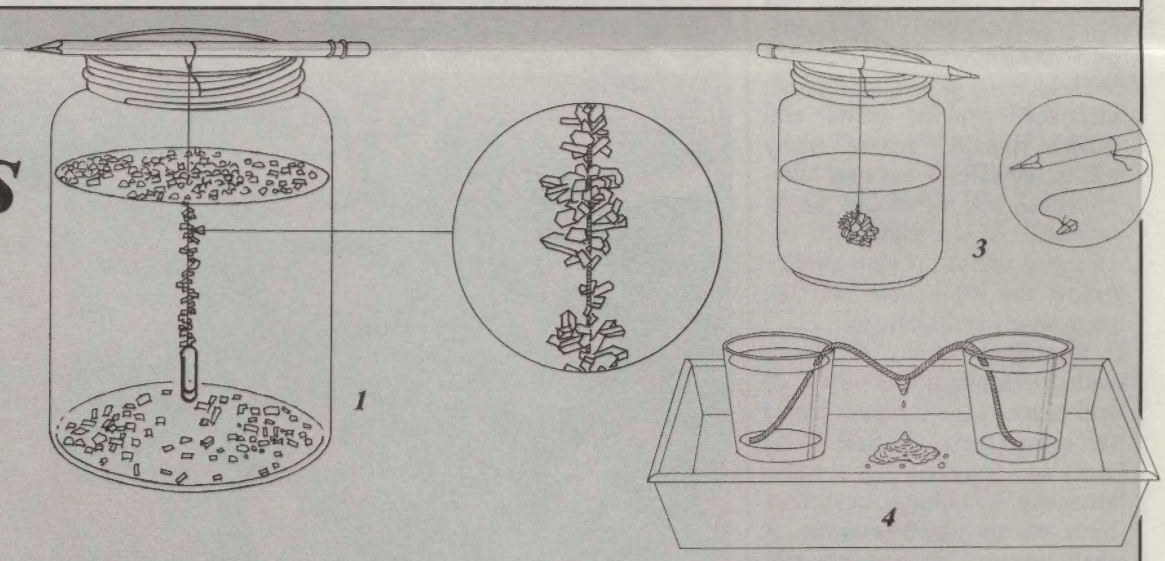
Several days later, you will be able to see the crystals which have grown onto the thread and the paper clip; you might like to take a closer look with a magnifying glass (see Figure 1 inset). You can let the crystals grow until all the water evaporates and then eat them — you have just grown rock candy!

To make sugar crystal decorations that you can hang or give as special gifts, shape a pipe cleaner and suspend it in the solution instead of the paper clip (see Figure 2).

Seeding

You can "seed" a supersaturated solution with a small crystal of the same substance that is dissolved in the solution. The seed enables the solution to begin depositing its excess material, ion by ion, molecule by molecule, on the surfaces of the seed; each one of these ions or molecules neatly positions itself, enlarging the pattern by extending the order that the seed crystal has.

To do this, just take one of the crystals you've already grown (choose a nice evenly shaped one) and hang it in a new cooled and filtered supersaturated solution (see Figure 3). Place the jar in an area where it won't be disturbed or subjected to drafts for a period of several weeks. Your crystal will grow slowly and evenly, and you will end up with a larger crystal that has the faces, angles and edges of the seed crystal from which it grew. If you find crystals growing on the sides and bottom of the jar, carefully remove your seed crystal and filter the solution into a new jar, hanging your seed crystal in this new jar; this will ensure that the solute leaving the solution will cause the seed crystal to grow, not the other incidental crystals.



Other Crystals You Can Grow

You can also easily grow salt crystals. For these, you will need less than one cup of salt for each cup of water. Follow the same instructions as for the sugar crystals, but use cold water.

You can grow other types of crystals from substances you can buy at your local supermarket or pharmacy, such as Epsom salts, boric acid, alum and baking soda — but don't eat these crystals!

A mixture of potash alum and chrome alum will yield purple crystals — the darkness of the purple depending on the amount of chrome alum used. Because these two compounds have the same crystal structure, ions from both substances will form one crystal. You could even get really fancy and mix a solution of each of the alums, moving your seed crystal from one to another every week for several weeks and end up with a banded crystal of purple and white.

Stalactite and Stalagmite

Another interesting experiment for you to try is to grow a stalactite. Saturate two glasses of hot water with Epsom salts. Soak a piece of cord in the solution and place each end of it into a glass with part of the cord sagging in the middle (to make it easier to move, set all this up in a baking pan or on a stiff piece of cardboard — see Figure 4). As the solution drips from the centre of the cord, water evaporates and the salt crystallizes out; you'll even have a stalagmite deposited too. The stalactite and stalagmite will grow much more quickly in a dry place. Try placing the tray in the bathroom and see how slowly it grows; move it to another room for faster growth.

Save your crystals by wrapping them in tissue paper and storing them in a sealed jar or plastic container. How many of your friends can you impress about the crystals you grew yourself?

Colette Morin
Public Services Division